

# **The Impacts of the Closure of Stuff On the Surviving Titles and Advertisers**

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## **Abstract**

The closure of Stuff has brought significant impact on the market and we aim to empirically analyze the response of surviving newspaper titles. We create our original dataset by manually collecting data, in terms of content wordcount, advertising ratio, and gross area of advertisement, from websites of eight newspaper titles. To make a comparison, we divide the eight newspaper titles into two groups: treatment and control. By running the DID model, we find that: first, titles in the treatment group did not expand content wordcount, however, content wordcount increases overall after the closure of Stuff. Second, surviving titles increase advertising space in response to Stuff's exit.

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## **ATTESTATION OF AUTHORSHIP**

I hereby declare that this submission is my original work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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Date:07/31/2020

## Chapter One: Introduction

The structure of New Zealand newspaper industry presents us an opportunity to investigate the impact of newspaper titles exit the market on surviving newspaper titles. This is because two major publishers, NZME and Fairfax (also known as Stuff), capture the major share of newspaper market. Likely, the closure of Fairfax titles would significantly impact the surviving NZME titles. In New Zealand, NZME owns both free and paid weekly newspapers, and they are all in the North Island. For the paid weekly newspapers, only the *NZ herald*, which is also the largest metropolitan newspaper across New Zealand, is located in Auckland; other five paid newspapers are in regional centers. Meanwhile, NZME owns twenty-two free weekly newspapers. For Fairfax, it owns nine paid daily newspapers, of which, four are in the North Island and five are in the South Island. Fairfax, in total, controls fifty-two free weekly newspapers across New Zealand. Also, there are independent publishers which capture the rest of the market. For example, *Allied Press* owns fourteen free weekly newspaper, which deliver services to west coast and lower part of South Island; it also provides Dunedin residents with paid weekly newspaper. In Tauranga, *Sun Media* owns two free weekly news outlets. *Beacon Media Group* concentrates on offering free weekly newspaper in Whangatane and Opoitiki. Generally, those small independent publishers mainly focus on local communities.

Recently, global media has followed a trend that the ownership is becoming concentrated, and New Zealand is not an exception. This phenomenon is taking place partially because the media industry is facing financial difficulties under the threat of the internet (Pew Research Centre, 2019). Consolidation of ownership allows media companies to cut costs, an essential strategy for survival (Smith, 2019). Another major factor that drives the merger in the media sector is that more content can generate more revenue (PwC, 2019). In New Zealand, there is an increase in concentration of ownership among newspaper publishers. For instance, NZME attempts to acquire Stuff (previously called Fairfax). However, the Commerce Commission rejected the proposed merger between STUFF and NZME in 2017 since the merger can result in the reduction of democracy in news outlets and a loss in voices of media. Eventually, the decline in revenue in Stuff has led to the closure of fifteen Stuff newspaper titles; they exit the market in either April or May 2018. Significantly, evidence shows that there is intense competition between free weekly newspaper titles with overlapping distribution (Cheung & Brooke, 2018).

This paper is retrospective study that analyzes the impact of Stuff's exit on surviving newspaper titles by using the Difference-in-Differences method. Our empirical study involves titles that experience market structural change as Stuff titles exit the business and titles that do not, focusing on comparing the result between those two groups of titles. Stuff (previously called Fairfax) and NZME are in duopolistic operation in New Zealand; together, they capture the majority of print and online market share, especially free weekly titles. Because of the decline in revenue and profit, Stuff decides to close fifteen titles. Of the fifteen closed titles, eight of them are in North Island, and the other seven titles are in South Island competing with different local publishers. Meanwhile, for the eight titles in the North Island, four of them compete with NZME titles and other four do not. We classify the eight titles into two groups: the treatment group and the control group. NZME titles that locate in same geographic regions with Stuff titles are in the treatment group, whereas NZME titles that did not experience any structural changes in the local market are in the control group. Therefore, we are able to observe the difference between two groups.

This paper also contributes to the economic literature. The newspaper market is two-sided, collecting revenues from readers and advertisers simultaneously. Focusing on variables such as product characteristics, retail prices, and advertising rates would be helpful for newspaper publishers to maximize profits (Corden, 1952). Many studies primarily concentrate on how news outlets differentiate themselves, in terms of offering diverse content, from other competitors, instead of analyzing two price-related aspects. For example, many studies analyze how the content of the newspaper, or consumers' preferences, would allow various titles with different sizes and types to survive in the same geographic location. Along with the trend of industry consolidation, most studies are paying more attention to the impact of a merger on the content of the newspaper, rather than prices (Cheung & Brooke, 2018). Importantly, they contribute by looking at consolidating ownership's effects on price-related factors. Our paper looks at the impacts of a merger on prices in a more detailed way.

We create our original dataset that includes total content wordcount, the ratio of advertisement, and the total gross area of advertising space to explore the impact of Stuff's exit on remaining surviving titles. In total, we collect data from eight NZME newspaper titles that are located in the same geographic region (the North Island) with Stuff titles. We can make a comparison and observe the difference between surviving NZME titles compete with Stuff titles

and titles compete with local publishers. We choose the time frame for data collection from November 2017 to November 2018 so that we can cover six months before and after Stuff closes the fifteen titles. Thus, we can examine the treatment effect of the closure of Stuff titles on the surviving titles in terms of the welfare of consumers and advertisers. We could also explore questions such as: how many advertisers who patronize Stuff switch to NZME titles after the closure of Stuff titles?

In our study, we obtain significant results. Cheung & Brooke (2018) has previously presented empirical evidence to support the New Zealand Commerce Commission's decision to reject the Stuff (Fairfax)-NZME merger application. They show that there is a strong competitive relationship among free weekly newspaper titles in one geographic location, and the merger can lessen competition. Our empirical research further supports the idea that the merger between Stuff and NZME would not only lead to a decline in competition but also a loss in the welfare of consumers and advertisers. We create three dummy variables in our regress: "Treated", "After", and "Their Interaction". "Treated" variable stands for titles in the treatment group, "After" stands for titles in the period after Stuff titles exit the market, and "Their Interaction" variable stands for "Treated" variable multiplies by "After" variable: treated titles in the period after Stuff's exit. Our results are as follows. Firstly, the regression result on the gross area of advertising space shows a positive and statistically significant coefficient for "Their Interaction" term. Simply, the result means after Stuff exit the market, surviving titles tries to increase the gross area of advertisement for advertisers. However, the welfare of advertisers still declines; the exit of Stuff titles left surviving NZME titles as the only news outlets in the local market. Although regression results show that NZME titles present an increasing amount of gross area of advertising space, the total amount of gross advertising space has decreased. For advertisers, they still have fewer options available. Secondly, the regression on the variable of "ratio of advertising space" shows a negative and significant coefficient for the treatment group. It means that titles in the treatment group are facing a smaller market than those in the control group. Perhaps this is also a driving factor for Stuff titles to quit the market; the revenue and profit of the operating business in those local markets cannot support the cost of running the business in those markets. Thirdly, after the closure of Stuff titles, total content wordcount in remaining NZME titles did not increase. Readers are not able to read the content that was offered by Stuff titles, as surviving NZME titles did not



attempt to offer more coverage. The decrease in competition results in NZME titles being the only monopoly to capture the market. The welfare of readers decreases.

The paper is organized as follows: Section 2 is the literature review, which covering the essential research on which our study based. Section 3 explains the collection of data, presenting the logic and method that we use to create the dataset. Section 4 presents and discusses the regression results. Section 5 concludes.

## **Chapter Two: Literature review**

The newspaper market is two-sided, selling products to readers and advertisers simultaneously, and revenues are collected from both sides. With maximization of profit of the newspaper, revenues and cost are the strategic factors, and their impact on competition is explained by Corden (1952). Specifically, newspaper publishers gain revenues from two primary sources: readers and advertisers. Newspaper publishers can collect more revenues from readers by selling more circulation of newspapers (quantity) or raising the price per copy sold (average) to readers. If everything else remains the same, the quality of content primarily determines the demand of one newspaper by readers. The nature and form of reading matter, as well as the amount of reading content, play an essential role in determining quality. Higher quality of content leads to more quantity (circulation) of the newspaper sold; thus, revenue from readers increases. The other product that newspaper publishers sell is advertising space. Generally, advertising rates for particular space (price) and the total area of advertising space (linage) determine how much revenue newspaper publishers could collect from advertisers. The circulation of newspaper is the primary impactor on revenues from advertising, although other factors, such as number of readers can reach, has an effect as well. The link between these two products is circulation: circulation is the quantity of one product (advertisement) sold and determines the quality of another product. For instance, a reader may purchase the newspaper is because of the advertisement, instead of the reading content. Therefore, the number of advertisements can, to some extent, influence the quality of the newspaper.

Further, the cost can be generally categorized into four groups: fixed cost, the costs that varies with reading quality, costs that relate to circulation, and costs from advertising. For example, the fixed cost refers to the fixed investments that do not vary with quantity and quality of sold newspaper. For example, to establish a new title, a publisher needs to invest in buildings and

equipment. Expenditure that varies with reading quality does not include cost, which can be altered to the quantity of newspaper sold, only consists of the cost to make changes in the quality of reading content. For instance, higher quality journalists cost more to hire. Costs that relate to circulation are not due to advertising, expenses for producing and accounting could be an example. Costs from advertising are attributable to the advertising side, as an example, salaries for hiring employees who sell produce advertisement.

Some studies focus on the pricing strategies of newspapers. In a competitive market, each newspaper publisher wants to expand its market share to maximize profit. Poaching rivals' consumers will incur a switching cost for individuals who change subscriptions from one to another. Therefore, there are motivations for newspaper publishers to offer lower prices to attract consumers. With a two-period model, Chen (1997) shows that newspaper publishers in the second period need to offer a price discount to ensure that the switching cost incurred for those consumers who did not purchase products from it will be offset. Unsurprisingly, firms with lower sales will be more prone to offer a price discount to expand the market share (also see Taylor (2003)). Fudenberg and Tirole (2000) look at prices and preferences (behavior-based price) in the second period: persuading consumers to switch newspaper titles. Given the fixed preferences of consumers from period one to period two, it is socially inefficient for consumers to switch from one title to another when only short-term contracts are available. Newspaper publishers offer a discount to steal customers and cover the cost of switching from opponents in the second period. Customers are willing to shift the purchase to other newspaper titles even though they like that title less. In the second period, each newspaper publisher is facing two separate markets: one with customers who patronize their products in the first period, the other with customers who patronize the competitor's products. Also, customers are rational such that they can take into account the poaching price in the second period when they decide in the first period. The larger the defender's market share, the higher the opponent's poaching price will be. Thus, given the fixed preferences, the demand in the first period becomes less elastic, compared to the situation with no price discrimination. Interestingly, long-term contracts facilitate the society to reach social equilibrium. Offering long-term contracts in the beginning to consumers can prevent consumers from being poached in the second period, as there is a severe penalty for switching. However, newspaper publishers choose to offer a higher price long-term contract in the first period and a lower penalty since publishers can discriminate consumers who have a strong preference for their

products from those who have merely a weak preference. Where preferences of consumers change enough to switch, a finite penalty can be helpful to transfer surplus from one publisher to another. Villas-Boas (1999) further shows that there is a convergence of market share and prices at a steady state. In a market where there are numerous firms (publishers) and overlapping generations of consumers, publishers can attract competitor's previous consumers in the market equilibrium. On the one hand, from the perspective of consumers, consumers foresee the probability of being exploited by publishers and see fewer differences between publishers in terms of price. On the other hand, publishers see the drawbacks of attracting too many previous clients. Thus, publishers tend to reduce the intensity of competition on price. As a result, in the steady-state, market share and price are converging. In addition, Chandra and Collard-Wexler (2009) indicate that the changes in ownership of Canadian newspaper publishers, such as through a merger, may not impact the price for either consumers or advertisers. This is because a merger can result in lower costs, and the motivation for merging can be driven by reasons other than profit maximization. Asplund, Eriksson, & Strand (2008) indicate that in the presence of local competition, newspaper publishers are prone to offer price discounts to attract consumers of rivals and to boost their circulation. Where the newspaper industry is competitively operated, a more significant proportion of sales are at a discount than the sales in the monopoly market. Moreover, the price of a newspaper is negatively related to the market share of the newspaper. Iyer et al. (2005) express that advertising on newspapers with content that targets precise consumer segments within the market can reduce wasted advertising for advertisers, bringing higher profit for firms

In addition to the studies of competition on the prices, another area of research is how the competition influences non-price aspects. George and Waldfogel (2006) present that along with the expansion of national newspapers (for example, the *New York Times*), the market share of the local newspapers decreases. In response, local newspapers modify their content to give more emphasis on local coverage and less on national and international affairs. As the *New York Times* steals educated consumers away from the local newspapers, local newspapers capture more market share of those less educated readers. Chandra (2009) suggests that newspapers that target homogeneous groups of consumers, by varying content, add value to advertisers and therefore possess a higher market capability to attract core subscribers to purchase their products than those that reach diverse groups of consumers.

Some studies focus on the impacts of joint ownership of publishers. Lacy and Simon (1997) indicate that the concentration of ownership helps newspaper publishers to save costs by restricting circulation areas. Newspaper titles in different geographic locations report exclusive content to local readers. As a result, newspaper publishers in adjoining areas can avoid expensive competition. Publishers do not need to offer readers better promotions and content; thus, publishers can gain high profits with less circulation. Chandra and Collard-Wexler (2009) show that a merger between newspapers may have an ambiguous impact on consumers' welfare, and there is no noticeable effect of a merger on prices on either side of the market: newspaper subscribers and advertisers. Even after a length of time, there is still no definite link between the concentrating ownership in publishers and higher prices. Cheung and Brooke (2018) study the interaction between joint ownership of titles and pricing strategy in New Zealand. The analysis shows that competition exists among free weekly suburban titles in the overlapping areas. Also, with the exit of Stuff, advertisers switch to NZME titles. Specifically, their preliminary retrospective study shows that the surviving local NZME title increases its page number following the exit of the local rival Stuff title. However, a detailed dataset that includes printed display and classified advertisements can be further established; for example, the identity of advertisers and the size of the ad. This research will be an extension of the preliminary retrospective study to analyze further the response of advertisers and remaining titles to the exit of Stuff.

### **Chapter Three: Data**

Cheung & Brooke (2018), using data on advertising rates, has indicated that there is an intense competition between free weekly suburban newspaper titles with overlapping distribution areas. We extend Brooke and Cheung (2019) by constructing a more detailed original dataset to analyze how the exit of Stuff impacts surviving NZME newspaper titles. Fifteen Stuff newspaper titles are exiting the market. While eight of the fifteen newspaper titles are in different geographic locations in North Island, the rest are in South Island. Among those eight newspaper titles that belong to Stuff in North Island, four of them were competing with free weekly suburban titles operated by NZME, and the other four newspaper titles were competing with other local publishers. However, in our retrospective study, we are primarily interested in areas where NZME and Stuff are overlap in distribution. By looking at those overlapping geographic markets, we can explore research questions such as: to what extent advertisers who patronized Stuff and NZME are overlapping? What are the responses of advertisers in the face of the exit of Stuff? Did those

advertisers change the size of advertisements in the surviving NZME titles? The newspaper industry is a typical example of the two-sided market, as the characteristics and number of readers will, to no small extent, determine the value of advertising space to advertisers. Meanwhile, by reaching similar segment readers in one area, Stuff titles and NZME titles show a certain level of similarity. As a result, with constant advertising rate, we can expect that advertisers who patronized Stuff would choose to switch to NZME when Stuff quit the market. Advertisers have fewer options, therefore the number of advertisers switching from Stuff to NZME reflects the intensity of competition between Stuff and NZME and the welfare loss of consumers from the loss in competition in the newspaper industry.

The creation and analysis of original data is our primary concern. We acquire data from eight different newspaper titles, which are *Rotorua Weekender*, *Napier Courier*, *Hastings Leader*, *Manawatu Guardian*, *Whangamata Coastal News*, *Hamilton News*, *Whanganui Midweek* and *Katikati Advertiser*. Then, we divide the titles into two groups, the treated group and the control group, for comparison. NZME titles that experience the exit of a local competing Stuff title are in the treatment group; those that do not experience any changes in local market structure are in the control group. For details, Table 1 lists the four Stuff titles that compete with NZME titles: Rotorua Review (Stuff) competes with *Rotorua Weekender*(NZME) in Rotorua; *Napier Mail* (Stuff) competes *Napier Courier* (NZME) in Napier ; *Hasting Mail* (Stuff) competes with *Hastings Leader* (NZME) in Hastings; and *The Tribune* (Stuff) competes with *Manawatu Guardian* (NZME) in Palmerston North. The use of treatment and control groups let us use the difference-in-differences method to estimate the treatment effect (how Stuff's closure impacts NZME's surviving titles). For instance, it allows us to extract out any macroeconomic effects that impact all newspaper titles. We did not include the seven titles located in the South Island because they were competing with other publishers, instead of NZME's titles. In other words, how advertisers respond to those remaining other publishers' titles is not part of our research question.

In terms of the time frame for our retrospective study, we use data starting from November 2017 to November 2018 (inclusive). This time frame allows us to collect data from six months before Stuff's exists (April-May) to six months after Stuff's closure for comparison. As a result, we can analyze how Stuff's exit impacts both treated and control group. The difference between

the treated group and the control group would be the treated effect brought by the closure of Stuff as only titles in the treated group are competing with Stuff's titles.

Our variables of interest are the total wordcount in the content, the ratio of advertisement, and the gross area of the advertising space. These factors are significant to newspaper publishers since they are essential for newspaper titles to attract readers and generate profits. Intuitively, if one's competitor exits the market, remaining newspaper titles are likely to capture a larger market share to maximize their profits. In response to the changing market share and consumer population, the content and advertising space may not stay constant; this is as to say, remaining NZME's titles may implement new market strategies, as a response to the latest market environment.

To construct our original dataset, we use the digital images of each issue in each newspaper title, which are publicly available online. For the wordcount variable, we screenshot each page of the newspaper for every issue. As measuring the number of words of content is time-consuming, we use software to transform each screenshot of the press into a word document. Then, we use the wordcount feature in Microsoft word to record the number of content wordcount for each page, manually excluding those words from an advertisement. Lastly, adding all the number of words of material together, we obtain the total wordcount for one issue. Repeating this method, we record the number of words for all issues of newspaper not only for those in the treated group but also those in the control group. The reason to analyze the content wordcount is to study whether Stuff's exit influences NZME surviving titles, which may adapt new strategies to fit a new operating environment, for example, report more information to readers. In other words, if titles in the treated group increase their content after Stuff's exits, this will indicate that those titles expand the content to do more coverage. If the content wordcount for those titles in the control group remains the same, then we can conclude more confidently that changes in NZME's surviving titles are indeed due to Stuff's closure.

Figure 1, Figure 2, and Table 2 summarize the original dataset. They cover the trend of content wordcount in eight titles in both treated and control group, with 55 observations for each title. Some titles have more issues over the same calendar period, as issues mainly have to do with what day of the week on which the title is published; some days (e.g. Monday) overlap with NZ public holidays more often. For example, for one calendar year, *Katikati* and *Whangamata Coastal News* have 57 issues, other titles have 55 issues. However, for conducting a comparison

between the treatment and control group, we choose to look at 55 issues for each title. Table 2 shows the summary of the dataset, including mean, standard deviation, minimum, and maximum for each variable. For details, the smallest mean number for the title in the treatment group is 6334.018, and only one title in the treatment group has a mean larger than 10,000. On the contrast, the smallest mean number for titles in the control group is 10002.42, and no titles have a mean number that smaller than 10,000. Generally, content wordcount in titles in the control group appear to have larger mean than those in the treated group. Figure 1 and Figure 2 show pattern of content wordcount for all titles, and the pattern of content wordcount are consistent with information in Table 2: on average, the patterns of content wordcount for titles in the control group start above titles in the treatment group. Specifically, titles in the treatment group are in red and titles in the control group are in blue. The yellow dotted line indicates the time when Stuff closed the fifteen newspaper titles. In Figure 2, fluctuations in titles in the treatment group and titles in the control group mostly follow a similar pattern. Before the closure of Stuff, wordcount in titles in the control group clearly goes through visible changes; after Stuff exits the market, treated titles seems to experience a relatively larger fluctuation than that of titles in the control group. The variation in the trajectory of treated titles becomes increasingly obvious as the timeline moves to the right, although titles in the control group still has, on average, larger total wordcount.

Table 2A shows the statistical description of content wordcount from a different perspective; how the mean number content wordcount for titles in both control group and treatment group before and after the closure of Stuff. Each row stands for one newspaper title, and the last row indicates the mean number including all observations in the control group and the treatment group. For instance, in the last row in column (1), we not only take average of all observations in the control group before Stuff exits the market, also showing the mean number for titles in the control group after the closure of Stuff in the last cell in column (2). For more information, column (1) shows the mean number of content wordcount for titles in the control group in the “before” period, and column (2) indicates the mean number of content wordcount for titles in the control group in the “After” period. Column (5) is the difference between column (1) and column (2), representing the impact of the closure of Stuff on titles in the control group. Similarly, column (3) stands for titles in the treatment group in the “Before” period, whereas column (4) refers to treated titles in the “After” period. Column (6) allows us to see how Stuff exits the market can influence titles in the treatment group. In column (5), only one title: *Whanganui Midweek* gains a negative figure,

all other three titles in the control group are positive. In other word, *Whanganui Midweek* is the only title in the control group that has decreased the content wordcount after the closure of Stuff. In contrast, in the treatment group, while *Manawatu Guardian* and *Hastings Leader* offer a smaller amount of content, *Rotorua Weekender* and *Napier Courier* try to cover more news stories. Although there are titles in both control and treatment group that choose to decrease the news coverage, the overall content wordcount has been increased; which is shown in the last row of column (5) and column (6). For details, 776.059 is the average difference for titles in the control group before and after the closure, and 1235.517 is the difference in mean for titles in the treatment. The difference between “Before” period and “After” is probably due to the time effect. The time effect is that over time newspaper titles, as companies, are inherently chasing for larger share of market to expand the profit, for instance, titles increase content wordcount to expand the readership. As a result, a further step of analysis in column (7) rules out the time effect. Significantly, we still obtain a positive result showing an increase in content wordcount. But this is a brief analysis to see the actual effect of the closure of Stuff on the remaining titles in terms of content wordcount, we need to run a robust regression in next section.

There are a number of reasons why the data might follow such a pattern. This may be due to NZME’s competition with Stuff: before Stuff exits the market, NZME titles have a relatively smaller segment of readers than those titles that were competing with other local publishers; therefore, a lower mean number indicates that NZME titles don’t have to cover content as much as titles in the control group. On the contrary, NZME titles in the control group would possess comparatively more market power to steal consumers from other local publishers. As a result, they may be able to increase the content based on the current business environment, more content will attract more readers. After the closure of Stuff, the trend that treated titles increase wordcount in content indicates that they are likely trying to cover more stories for readers and capture the Stuff’s market share.

Our next variable of interest is the area of advertisement on each page, for each title and issue. For the collection of the size of advertisement for each newspaper, we first use a ruler to manually label the size of the whole tabloid page and all the advertising space on one tabloid page. Usually, newspaper titles have regulated sections for advertisement. The ratio of an ad on each newspaper page range from 1/8-tabloid page area to full-tabloid page area (for instance, 1/6, 1/4, 1/3, 1/2, 3/4-tabloid page areas). We then divide the advertising space of one page by the size



of the whole page to obtain the advertisement ratio. For example, if the size of the advertisement is ten square centimeters and the full-tabloid page size is 100 square centimeters, the advertising ratio will be 1/10-tabloid page areas. Lastly, by averaging all ratio together for one newspaper issue, we obtain the average advertisement ratio. As an example, if there are ten pages for one issue, and the advertising ratio for each page is around 1/2-tabloid page area; then, the average proportion of advertisement for this issue is  $50\% \times 10/10 = 50\%$ . The investigation of the advertising ratio for all variables can give us a sense of how closing Stuff titles can influence NZME titles, particularly whether advertisers choose to shift to NZME titles.

Figure 3 summarizes the dataset for the ratio of advertisement. Similar to Figure 1 and Figure 2, the red line refers to treated titles and those blue line are titles in the control group. Figure 3 shows the visual trend of the rate of advertisement. Surprisingly, the pattern in the Figure 3 does not show significant differences between titles in the treated group and titles in the control group. Ratios of advertisement of Whanganui news (control group) and Costal news (control group) reach a peak on 08/23/2018.

Like in Table 2A, we follow the same format in Table 3 to show average number of advertising ratio for titles in both control group and treatment group before and after the closures. Specifically, in column (5), only one title: *Whanganmata Costal News* gains a positive figure, all other three titles in the control group are negative. In other word, *Whanganmata Costal News* is the only title in the control group that has increased the advertising ratio after Stuff's exit. In contrast, only one title: *Rotorua Weekender* in the treatment group has shown a negative sign for the mean number, other three titles decide to expand the space for advertisement. Moreover, we observe an increasing trend in advertising ratio; larger ratio of advertising facilitates newspaper titles to capture larger advertising market. For details, 0.022 is the average difference for titles in the control group before and after the closures, and 0.047 is for the difference for titles in the treatment. Meanwhile, the factor of timing sequence effect could also play an important role in the enlargement of ratio of advertising for titles. Further, after eliminating the time effect, we see a positive indicator in column (7) showing that the actual impact of closing Stuff makes surviving titles increase the ratio of advertising. This DID estimation is an initial analysis by manually calculating the average number. To analyze the exact effect on NZME titles, we need to do further regression.

Market condition could be the main factor that lead to the pattern in Figure 3. Newspaper titles with similar advertisement ratios might indicate a similar quantity of advertisers. This means that titles already maximize the space for advertising and offering more advertising space cannot stimulate the profitability; they tend to have similar proportion of tabloid for advertising as the market for advertisement is approach to perfectly competitive. However, at this stage, we cannot observe the driver for the extraordinary changes in titles in the control group.

In addition to the ratio of advertisement, we also consider the gross area of advertisement as a variable of interest. It is important since it allows us to look at the titles' advertising outcome from another perspective. The ratio of advertising space may give us insufficient information about surviving NZME titles' advertising lineage, because the gross area of advertising space can increase with the ratio of advertisement stays constant, as total content wordcount may increase in the meantime. For each title, we multiply the ratio of advertisement by total number of pages to obtain the amount of advertisement. We use our original dataset for ratio of advertising space shown in Table 3A and Cheung & Brooke (2018)'s dataset for total number of pages, and Table 4, where we present total pages and ratio of advertisement for each title, summarizes the dataset for regression on gross area of advertising space. As an example, *Hamilton News* has 40 pages in total and 50% of them is for advertisement, then there are  $40 \text{ pages} \times 50\% = 20 \text{ pages}$  for the amount for advertisement. Figure 4 presents the pattern of our data about the amount of advertisement. Unlike to Figure 3, where the trend for each title is similar and stable, the pattern in Figure 4 shows fluctuations both before and after the closure of Stuff. On 14/12/2017, titles in the treatment group undergone substantial changes: the amount of advertisement has decreased dramatically. Yet, titles in the control group are not significantly impacted. Meanwhile, on 30/08/2018, except two titles in the control group, other titles considerably expand the gross area for advertising space. Particularly, the pattern for treated titles are similar and are different for titles in the control group.

Similar to Table 2A and Table B, Table 4A presents a general analysis of gross area of advertisement based on comparing the mean of titles. For instance, in the control group, unlike *Whanganmata Costal News* and *Hamilton News* experience a decline in the gross area of advertisement. We observe an increased amount of advertisement available in *Whanganui Midweek* and *Katikati Advertiser*. Significantly, all titles in the treatment group offer more area of advertisement to advertisers. Generally, we can see that, after the title closures, all titles tend to

attract advertisers by providing extra amount of advertising; we obtain two positive results, 0.023 in column (5) and 2.731 in column (6), respectively. Moreover, column (7) shows a positive DID result after controlling the time-confounding factor.

Stuff titles lead to the fluctuations in gross area of advertising space in treated titles. From our data, we can observe that only titles in the treatment group are significantly impacted. If macroeconomic conditions cause the changes in gross area of advertising space, such as economic downturn, we should also observe fluctuations in titles in the control group. The decline in the gross area of advertisement is probably due to Stuff trying to capture a larger share of market, for example, by offering advertisers discount in advertising rates. As a result, NZME titles have to reduce the advertising space. However, after the closure of Stuff, NZME titles attempt to retake the market share. NZME titles are so determinant to have the advertisers back that they even offer more advertising space than before; advertising space reaches the peak in treated titles. Interestingly, although titles in the control group do not compete with Stuff titles, two of them decide to raise the amount of advertisement. We cannot tell logic behind the scenario; however, it can be related to the local publishers and the local market.

#### **Chapter Four: Analysis and Interpretation**

This section contains two parts: section 4.1 presents the logic of the Difference-in-Differences method, and the second part presents and interprets our regression. In the first part, we explain the reasoning of the Difference-in-Differences method with the help of equations and figures. Section 4.2 presents and interprets the regression result. Most importantly, we find a significant effect on what variable of interest of the closure of Stuff on the remaining NZME's titles.

##### **4.1 Analysis**

In social science such as economics and public policy, the Difference-in-Differences is a widely accepted method to estimate the causal effect of a policy. The DID possesses an inherent advantage. Unlike randomized experiments that compare samples in treated and control groups, the Difference-in-Differences allows researchers to run an “experiment” in a non-randomized setting; in other words, there is no distinct control group as treatment is not randomly allocated. Thus, the main difficulty in analyzing causal effect with Difference-in-Differences is to define a proper control group (Fredriksson & Oliveira, 2019).

The idea behind DID is to calculate double differences by collecting data on outcomes of interest pre- and post-policy. In general, researchers can estimate the casual effect by first calculating the before-after difference of outcomes in the treated group, and then netting out

before-after difference of outcomes in the control group. The availability of data is a prerequisite to conducting DID regression. As an example, Card & Krueger (1994) use DID to estimate the impact of improvement of the minimum wage in New Jersey on employment in fast-food restaurants. In this study, the authors define the neighboring state Pennsylvania as the control group to make a comparison. Furthermore, the DID utilizes data from the cross-sectional treatment and control groups, before and after the policy's implementation. A change in the outcome variable in the treatment group could be a result of the intervention of the policy. However, it could also be because of other factors that occurred that are unobservable in the dataset (Fredriksson & Oliveira, 2019). For example, raising the minimum wages in New Jersey has led to an increase in the employment rate in fast-food restaurants. However, while raising the minimum wages, there can be other programs in local council to boost the employment rate, and these local programs may play a more significant role than the increase in minimum wages. While it is possible to add other control variables to the dataset, a researcher might not know about all the factors that might potentially influence the outcome. As a result, it is difficult to control all variables. Therefore, the use of treatment-control and before-after comparisons provides a remedy, deducting the before-after difference in the control group from the before-after difference in the treatment group. By doing so, researchers can observe the time effect; other factors may impact the outcome of interest over time in the control group. The elimination of the before-after difference in the control group can subtract out the effects of these other factors. Assuming that explanatory variables did not include all important factors that influence the outcome (so-called omitted variables), then the difference between the treatment and control groups remains constant over time, so that DID method eliminates the influence of omitted variables on the outcome (Lechner, 2011).

We can demonstrate the DD method with the following equation:

To begin with, the first difference between the treatment group and the control group can be:

$$\beta = \bar{y}_{\text{treatment}2} - \bar{y}_{\text{control}2} \quad (1)$$

where  $\beta$  is the causal effect caused by the intervention of policy,  $\Delta \bar{y}_{\text{treatment}2}$  is to the change in the treatment group in period two (after the implementation of policy),  $\Delta \bar{y}_{\text{control}2}$  is the change in the control group in period two (after implementing the policy). Equation (1) gives the first difference; however,  $\beta$  may also include influences of omitted factors. Thus, a further step is needed to achieve the double-difference:

$$\beta = (\bar{y}_{\text{treatment}2} - \bar{y}_{\text{treatment}1}) - (\bar{y}_{\text{control}2} - \bar{y}_{\text{control}1}) \quad (2)$$

For a graphical explanation, Figure 5 further illustrates the essence of the DID method. On X-axis,  $t=1$  and  $t=2$  refer to Figure 5 (before policy intervention) and period two (after policy intervention), respectively. As shown in Figure 5, the blue line stands for the trend of the treatment group over time, and the purple line refers to the development of the control group. Most

importantly, the dotted green line tells us what the treatment group would have become with no implementation of the policy. Specifically, without the intervention of policy,  $(\bar{y}_{\text{treatment}2}^* - \bar{y}_{\text{treatment}1}) = (\bar{y}_{\text{control}2} - \bar{y}_{\text{control}1}) = \hat{O}$ . In other words,  $\hat{O}$  is a result of time effect, which is the impact of factors other than the policy on the outcome. In contrast, with the treatment (policy), the treated group at period one  $\bar{y}_{\text{treatment}1}$  becomes  $\bar{y}_{\text{treatment}2}$  at period two. As a result, the before-after difference in the treatment group is greater than that of in the control group:  $(\bar{y}_{\text{treatment}2} - \bar{y}_{\text{treatment}1}) > (\bar{y}_{\text{control}2} - \bar{y}_{\text{control}1})$ . Additionally, netting out  $\hat{O}$  can result in controlling all other differences. This is how a researcher can estimate the true causal effect of a policy by calculating:  $(\bar{y}_{\text{treatment}2} - \bar{y}_{\text{treatment}1}) - (\bar{y}_{\text{control}2} - \bar{y}_{\text{control}1}) = (\hat{O} + \beta) - \hat{O} = \beta$ , where  $\beta$  is the estimated causal effect of the policy.

## 4.2 Interpretation

Table 5 shows the results for our regression on gross area of advertising space, ratio of advertisement, and content wordcount. Statistics are reported in 95% confidence level and P-values are in parentheses. The first column on the left includes the independent variables: “Treated”, “After”, and “Their interaction (Treated\*After)”. For details, “Treated” variable refers to titles in the treatment group, “After” variable refers to all titles in the period after the closure of Stuff titles, and “Their Interaction” refers to treated titles in the period after Stuff exits. Meanwhile, column two to column four show three sets of regression results. All the regressions are based on the same 441 observations. Values of  $R^2$  are also presented,  $R^2$  shows to what extent the change in dependent variable is explained by the independent variables.

We first analyze the gross area of advertisement, which is obtained by multiplying the ratio of advertising space by the total number of pages. As shown in Table Five, for “Treated” variable, the estimated coefficient is 0.12 with P-value equals 0.87, and the result is statistically insignificant. We observe a negative coefficient: -8.47 for “After” with P-value 1.56E-29, which is statistically significant. For the last regressor “Their Interaction (Treated \* After)”, the regression gives us a positive coefficient: 2.59 and statistically significant, P-value is 0.009.  $R^2$  is 0.33.

After the closure of Stuff titles, surviving NZME titles increase the amount of advertisement whereas other titles do not. For “Treated” variable, we fail to reject the null hypothesis that coefficient is zero since the result is positive but statistically insignificant. As a result, we mainly look at “After” variable and “Their Interaction” variable. The negative coefficient for “After” indicates that, after the closure of Stuff, the average amount of advertisement from all titles decreases; this might be the reason why Stuff chose to exit the market in those geographic locations as Stuff could foresee the situation where the overall revenue was getting smaller. Factors such as the decrease in population in those areas could shrink the size of local markets, as the majority of population in New Zealand lives in metropolitan areas like Auckland where there are relatively more working opportunities, education and health care resources. Immigration policy may also play a critical role. The top destination for most immigrants in New Zealand is

Auckland since they, such as computer scientists and senior managers in international corporations, might be not able to find equivalent working positions in places other than Auckland. Therefore, without the implementation of immigration policy that favors remote areas or places with small population base, new immigrants are less likely to settle in economically undeveloped areas. Thus, decreasing consumer base leads to a decline in Stuff titles' revenue which might not be able to cover all the cost to run business. Moreover, a positive and statistically significant coefficient for "Their Interaction" means that after Stuff exits the newspaper industry, remaining NZME titles decide to increase the space for the advertisement. This might be because NZME titles would like to capture a proportion of advertisers who used to patronize Stuff. The major source of income for free weekly newspaper titles is from advertisers. Although larger readership would allow newspaper titles to attract larger number of advertisers to increase revenue, currently a smaller market size makes it difficult for surviving titles to increase readership, thus they switch their priority to attracting advertisers. Surviving titles provide readers with free weekly newspaper and there is no revenue. Significantly, the regression result also fits to our observation in Figure 4, where treated titles experienced a large rise in amount of advertising space. According to the regression results in Table 5, the welfare of advertisers is likely to decrease in that the total amount of advertising space is smaller than before.

We analyze the ratio of advertisement out of total number of pages in each title and issue. As the second result column in Table 5 shows the coefficient for the "Treated" variable is negative: -0.08 and statistically significant in 95% confidence level with P-value equals 0.001. In the meantime, the "Their Interaction" term is positive: 0.03 yet statistically insignificant as the P-value is 0.27. For the "After" term, the estimated coefficient is positive and statistically insignificant. The coefficient is 0.02 and P-value is 0.27. The results are different to results in regression on gross area of advertisement.

In general, the closure of Stuff decreases the welfare for advertisers. A negative coefficient for "Treated" term means that the treatment titles have always had a smaller ratio of advertising space, compared with the control titles. In comparison to the statistically significant "After" variable in the regression on gross area of advertising space which shows that the market size becomes smaller after the closure of Stuff titles, "Treated" variable in regression on ratio of advertisement partially concludes that market size is indeed always smaller for titles in the treatment group than that of titles in the control group. Maybe this is why Stuff titles decide to exit the market as generating revenue and covering costs is difficult. Additionally, the smaller market can also be linked to factors such as smaller population live in those area. The newspaper market now is a monopoly market for local print advertising, thus there is a loss in competition. However, competition brings welfare to both readers and advertisers. First, newspaper titles' market share is inversely related to the use of discounts. A monopoly newspaper title is less likely

to offer discounts to both advertisers and readers<sup>1</sup>. Newspaper titles which compete with other titles tend to offer more discounts to capture more market share than those do not. Also, libertarian theory of press<sup>2</sup> expresses that newspapers should compete for audience, advertisers, and capital to each other. Competition among newspaper titles will bring better quality and services to consumers. It will also bring lowest possible price. In a monopolistic market, consumers do not have freedom to make the selection of newspaper titles. From the perspective of society, newspapers' competition will lead to innovation and pluralism in society; competition is the agent who can allocate brilliant ideas in the society<sup>3</sup>. Therefore, the closure of Stuff lead to a loss in competition, decreasing the welfare not only for advertisers but also for the society.

Lastly, we analyze the total content wordcount. Table Five shows the regression results. Treated variable is negative: -1778.56 and After variable is positive: 1351.94. Treated variable and After variable are both statistically significant, with P-value equals 9.24E-07 and 0.0002, respectively. However, the "Their Interaction" variable is statistically insignificant, and the coefficient of "Their Interaction" variable is 27.60. In total, there are 441 observations and R<sup>2</sup> equals 0.14.

The closure of Stuff could lead to a loss in consumers' welfare and changes in content coverage in other titles. Negative Treated coefficient indicates that the treated titles have always have a smaller wordcount, both before and after the exit of Stuff. Moreover, the logic of negative value of "Treated" variable in content wordcount matches the logic of negative value of "Treated" variable in Ratio of advertisement. Previously, the regression on Ratio of advertisement indicates that titles in the treatment group had a smaller market in terms of ratio of advertising space than that of titles in the control group. Similarly, negative value of "Treated" variable in content wordcount again implies us a smaller market size for the treated titles, comparing to titles in the control group. As a result, we may further confirm that the insufficient economic activities in the market of treated titles can be the most crucial driver of the decline in revenues in Stuff titles. Therefore, Stuff titles eventually decide to exit the market. From the perspective of consumers, they have less to read as NZME titles did not cover the content which Stuff titles presented. If consumers love to read content in Stuff titles, there is no substitution. Also, if readers would like to read newspapers, they would have no option but to switch to surviving NZME titles. According to financial commitment theory<sup>4</sup>, when the intensity of competition among newspapers increases, there will be an incremental investment in titles to employ reporters to diversify content. Also,

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<sup>1</sup> Asplund, M., Eriksson, R., & Strand, N. (2008). Price discrimination in oligopoly: evidence from regional newspapers. *The Journal of Industrial Economics*, 56(2), 333-346.

<sup>2</sup> McManus, J. (1994): *Marketed Journalism – let the Citizen Beware?* Thousand Oaks: Sage.

<sup>3</sup> Doyle, Gillian (2002): *Media Ownership*, London: Sage.

<sup>4</sup> Barry R. Litunand and Janet Bdgcs."An Economic Analysis of Daily Newspaper Performmanace." *Newspapr Rewarrh Journal*, Spring 1986. pp. 9-26.

more competition will drive news outlets to allocate more news sections to make local news coverage. Otherwise, there will be less content coverage. Because NZME is the only competitor to Stuff in those areas, as Stuff quit the market, there is a loss in competition and consumers' welfare. This result also supports the court's decision to reject the merger. Moreover, the estimated coefficient for the "After" variable is positive and statistically significant. This shows that all titles increase the content after the closure of Stuff titles. Interestingly, a rise in content in the "After" period seems to be reasonable as we observe a decline in gross area of advertising space in the "After" period. Logically, titles that prefer to report more content would have to decrease the space for advertisement. We can see that all titles would like to cover more content to provide consumers with substitutions for rivals: Stuff titles.

#### Common trend assumption.

One of the key assumptions to run DID estimation is the common trend or parallel assumption. This assumption says that before the implementation of policy, the outcome trend for treatment group and control group should follow the same pattern; in other word, the difference between the trend for treated group and the control group should stay constant in each period, as there are other confounding factors, rather than implementation of policy, that can influence the causal effect. With the assumption of common trend, DID analysis can make the accurate estimation. One way to test the assumption of common trend is to study the data in the pre-reform period. If the curve for both treatment group and control group exhibit a similar pattern, then we can conclude with confidence that the common trend assumption is satisfied; if not, the DID estimation is less robust.

Figure 1, Figure 2, Figure 3, and Figure 4 enable us to have a visual inspection of trends in the pre-treatment period for both treatment and control group. We divide our dataset into different periods to make comparison. The test includes the interaction between time dummies and treatment indicator, then we can observe whether the time effect influence our estimation. For details, we primarily focus on the periods that closest to the point of time where Stuff exits the market. For content wordcount, we can see the pattern in Figure 2 shows that titles in treatment group and control group has, in general, followed a similar trend before Stuff exits the market. However, content wordcount experiences a relatively more fluctuated curve than those in the control group when they are getting close to the point of the closure of Stuff. In contrast, we look at the curve for the ratio of advertisement in Figure 3 before the closure of Stuff, we did not see a significant difference between the treatment group and the control group. Similar to the ratio of



advertisement, the gross area of advertising in Figure 4, titles in both treatment group and control group also show identical fluctuations before Stuff's exit. Meanwhile, we can clearly see a larger fluctuation in treatment group for the ratio of advertisement and the gross area of advertising than that of titles in the control group after the closure of Stuff. This could mainly due to Stuff's exit instead of timing effect. Therefore, we conclude that our DID estimations more or less hold the common trend assumption, at least for the ratio of advertisement and the gross area of advertising.

## **Chapter Five: Conclusion**

In this paper, we investigate the impact of the closure of Stuff titles on surviving titles. Stuff titles and NZME titles capture the major share of New Zealand newspaper market, which facilitates us to do analysis. Cheung & Brooke (2018) shows that, with overlapping regions of distribution, free weekly suburban news outlets compete with each other, and the preliminary retrospective study shows the existence of competition for advertisers between NZME and Stuff before the closure of Stuff titles. Our research extends the preliminary retrospective study by analyzing detailed data. We create our original dataset of total content wordcount, the ratio of advertisement, and the total gross area of advertising space. First, we construct our dataset by manually obtain information from eight newspaper titles' websites, which are publicly available. Specifically, the eight newspaper titles are: *Rotorua Weekender*, *Napier Courier*, *Hastings Leader*, *Manawatu Guardian*, *Whangamata Coastal News*, *Hamilton News*, *Whanganui Midweek* and *Katikati Advertiser*. For the ratio of advertisement, we manually label and use our eyeballs to measure the size of advertising space and divide the size of advertisement by the total size of pages of newspaper to have the advertising ratio. Constructing dataset about total gross area of advertising space requires us to multiply the advertising ratio by the total number of pages in each title. For the collection data for content wordcount, we screenshot content in each issue and each title from newspaper titles' websites. Then, we transform those screenshots into word documents to record the wordcount. Second, we divide the eight titles into two groups to make comparison. Titles that experience a market structural change caused by the closure of Stuff are in the treatment group and titles do not are in the control group. Titles that are in the treatment group are: *Rotorua Weekender*, *Napier Courier*, *Hastings Leader*, and *Manawatu Guardian*. Titles that are in the control group are: *Whangamata Coastal News*, *Hamilton News*, *Whanganui Midweek* and

*Katikati Advertiser*. Third, we use Difference-in-Differences method to run regression and estimate the impact. We choose to examine these variables because newspaper titles need to offer services to both readers and advertisers and these variables play an important role in generating revenues and profit for newspaper titles. The closure of Stuff titles might have an impact on not only surviving titles but also local readers and advertisers, as surviving titles are competitors to Stuff titles and readers and advertisers are targeting consumers to all titles. In this regard, the variables are closely related to the welfare of readers and advertisers and could be a measurement of gains and loss of welfare. We find that the closure of Stuff titles does affect the surviving NZME titles.

After the closure of Stuff titles, the total content wordcount for those treated titles did not increase. Surviving titles were not planning to expand their offering, maybe due to the costs of doing so; the enlargement of content, for free weekly titles, does not directly generate profits. This can also be one of the reasons why Stuff titles choose to exit the market as there is no sufficient profit to support the operation of the business in those regions. However, in the period after Stuff's exit, we see a rise in the content wordcount. This may occur due to factors such as a boom in economy or factors we cannot observe from this regression. Besides, we also see that after Stuff titles exit the market, the total gross area of advertising space decreases. Reasons for this situation could be a smaller size of market or smaller population in those areas. Therefore, insufficient revenue and profit to support the operation of business drives the closure of Stuff titles. However, the remaining NZME titles' reflection on the closure of Stuff titles is to offer an increasing amount of advertising space for advertisers, a way to capture larger market share to gain more revenue. Generally, although remaining NZME titles increase the gross area of advertising, both consumers and advertisers are still experiencing a loss in welfare after Stuff titles exit the market since they have fewer options available.

Our study has potential for further research and is relevant to places. Although the study empirically supports Cheung & Brooke (2018)'s idea that there is competition between NZME and Stuff and the Commerce Commission's decision to reject the merger between Stuff and NZME, certain aspects can be investigated in the future. For example, what are the factors that drive titles in the treatment group to not increase content? Why do titles in the "After" period decide to increase their content? Moreover, the newspaper industry in New Zealand and Australia are very similar, both countries have few newspaper publishers, and they are concentrated.

Therefore, our study applies to the Australian market as well.

## Tables and Figures

**Table 1: List of Free Weekly Suburban Titles Closed by Stuff in April-May 2018**

Stuff closing titles	Geographic market	Surviving NZME titles
Rotorua Review	Rotorua	Rotorua Weekender
Napier Mail	Napier	Napier Courier
Hasting Mail	Hastings	Hasting Leader
The Tribune	Palmerston North	Manawatu Guardian

**Table 2: Content Wordcount**

	Variable	Observations	Mean	Sta. Dev.	Min	Max
Treatment Group	Manawatu Guardian	55	6334.02	1536.18	3481	11214
	Rotorua Weekender	54	9386.63	3165.45	3745	18567
	Hasting Leader	55	10320.84	2039.768	6737	15916
	Napier Courier	55	8975.80	2609.629	3910	16096
Control Group	Katikati advertisers	57	10002.42	2576.412	1826	18511
	Hamilton News	54	11964.46	2189.13	8126	17081
	Whangamata Costal	57	10013.02	2590.13	1826	18511
	Whanganui Midweek	54	10107.67	3192.21	4977	18872

Table

2A: Content wordcount: Differences between the Control group and the Treatment group before and after Stuff's exit

Content wordcount: Differences between the Control group and the Treatment group before and after Stuff's exit							
	Control Group		Treatment Group		Differences		DID (7) = (6)-(5)
	(1)=Before	(2)=After	(3)=Before	(4)=After	(5)=(2)-(1)	(6)=(4)-(3)	
<i>Whanganm ata Costal News</i>	9197.423	10697.064			1499.641		
<i>Whanganui Midweek</i>	10451.652	9852.451			- 593.201		
<i>Katikati Advertiser</i>	9197.423	10677.580			1480.157		
<i>Hamilton News</i>	11549.043	12272.677			723.634		
<i>Manawatu Guardian</i>			6574.375	6147.935		-426.44	
<i>Rotorua Weekender</i>			7111.173	11074.871		3963.698	
<i>Hastings Leader</i>			10712.500	10017.613		- 694.887	
<i>Napier Courier</i>			7792.333	9892.032		2099.699	
Mean (all titles)	10098.885	10874.944	8047.596	9283.113	776.059	1235.517	459.458

Table 3: Advertisement Ratio: Differences between the Control group and the Treatment group before and after Stuff's exit

Advertisement Ratio: Differences between the Control group and the Treatment group before and after Stuff's exit							
	Control Group		Treatment Group		Differences		DID
	(1)=Before	(2)=After	(3)=Before	(4)=After	(5)=(2)-(1)	(6)=(4)-(3)	(7)=(6) - (5)
<i>Whanganmata Costal News</i>	0.718	0.838			0.12		
<i>Whanganui Midweek</i>	0.654	0.623			-0.031		
<i>Katikati Advertiser</i>	0.729	0.720			-0.009		
<i>Hamilton News</i>	0.756	0.749			-0.007		
<i>Manawatu Guardian</i>			0.703	0.724		0.021	
<i>Rotorua Weekender</i>			0.636	0.621		-0.015	
<i>Hastings Leader</i>			0.570	0.638		0.068	
<i>Napier Courier</i>			0.585	0.703		0.118	
Mean (All titles in control/treatment)	0.712	0.734	0.624	0.671	0.022	0.047	0.025

Table 3A: Ratio of Advertising Space

Variable	Observations	Mean	Sta. Dev.	Min	Max
Manawatu Guardian	55	0.7134	0.6259	0.5275	0.8111
Rotorua Weekender	54	0.7134	0.6259	0.5275	18567
Hasting Leader	55	0.6281	0.6262	0.4960	0.8009
Napier Courier	55	0.6519	0.8984	0.4202	0.8200
Katikati advertisers	57	0.7243	0.3560	0.6375	0.3836
Hamilton News	54	0.7527	0.0290	0.6997	0.8228
Whangamata coastal	57	0.7835	0.3503	0.6109	4.4964
Whanganui Midweek	54	0.6346	0.5790	0.4712	0.7712

Table 4: Gross Area of Advertising Space(Units:cm<sup>2</sup>)

Variable	Observations	Mean	Sta. Dev.	Min	Max
Manawatu Guardian: pages	55	24.9636	4.6784	16	40
Manawatu Guardian: gross area of ads.	55	17.7874	3.4520	10.55	26.8484
Rotorua Weekender: pages	54	21.4814	3.9080	16	32
Rotorua Weekender: gross area of ads	54	13.5023	2.8512	8.36729	21.3623
Hasting Leader: pages	55	20.9455	1.7150	20	24
Hasting Leader: gross area of ads	55	12.7373	1.7343	9.5625	17.64
Napier Courier : pages	55	23.8546	4.3521	20	36
Napier Courier: gross area of ads.	55	15.6756	4.1602	9.68	28.0909
Katikati advertisers: pages	57	33.7193	5.1156	20	48
Katikati advertisers: gross area of ads	57	24.3406	3.7566	14.5833	33.255
Hamilton News: pages	54	34.5925	3.2185	28	44
Hamilton News: gross area of ads	54	26.0152	2.3977	21.6611	31.6555
Whangamata coastal: pages	57	23.5087	7.0940	16	48
Whangamata coastal: gross area of ads	57	16.8143	5.3695	7.1943	33.9876
Whanganui Midweek: pages	54	31.7037	6.5865	24	48
Whanganui Midweek: gross area of ads	54	20.2717	5.2936	11.3088	35.2653



Table 4A: Gross area of advertising: Differences between the Control group and the Treatment group before and after Stuff's exit(Units:cm<sup>2</sup>)

Gross area of advertising: Differences between the Control group and the Treatment group before and after Stuff's exit							
	Control Group		Treatment Group		Differences		DI
	(1)=Before	(2)=After	(3)=Before	(4)=After	(5)=(2)-(1)	(6)=(4)-(3)	(7)=(6)-(5)
<i>Whanganmata Costal News</i>	18.752	17.059			-1.693		
<i>Whanganui Midweek</i>	20.171	20.380			0.209		
<i>Katikati Advertiser</i>	23.263	25.677			2.414		
<i>Hamilton News</i>	26.435	25.595			-0.840		
<i>Manawatu Guardian</i>			16.641	18.908		2.267	
<i>Rotorua Weekender</i>			12.290	14.715		2.425	
<i>Hastings Leader</i>			12.154	13.343		1.189	
<i>Napier Courier</i>			13.201	18.241		5.040	
Mean (All titles in control/treatment)	22.155	22.178	13.571	16.302	0.023	2.731	2.708

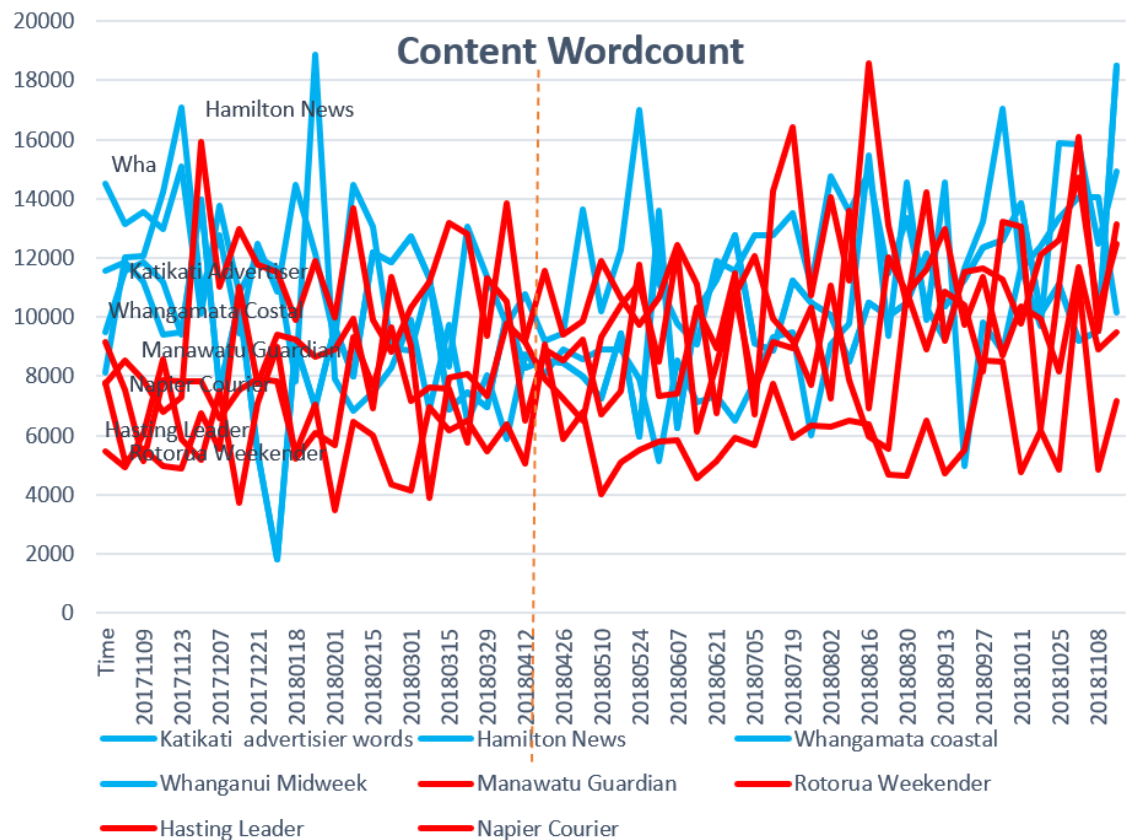
Table 5:

Table Five			
Regression on Gross Area of Advertising Space, Ratio of Advertisement, Content Wordcount			
	Gross area of advertising space	Ratio of Advertisement	Content wordcount
Intercept	22.08* (7.1E-167)	0.71* (1E-146)	9868.56* (1.3E-145)
Treated	0.12 (0.87)	-0.08* (0.001)	-1778.56* (9.24E-07)
After	-8.47* (1.56E-29)	0.03 (0.27)	1351.94* (0.0002)
Interaction (Treated* After)	2.59* (0.009)	0.02 (0.68)	27.60 (0.96)
R <sup>2</sup>	0.33%	0.38	0.14
N	441	441	441

(P-value are in parentheses)

(\* denotes statistical significance at 0.05 level)

Figure 1: Content wordcount



Treated group: Manawatu Guardian: 9386 Hasting Leader:10368 Napier Courier:8859 Rotorua Weekender:9917<sup>4</sup>

Control group: Katikati advertiser:9917 Hamilton News: 11964 Whangamata Costal:9928 Whanganui Midweek:10107<sup>4</sup>

Figure 2: Content Wordcount

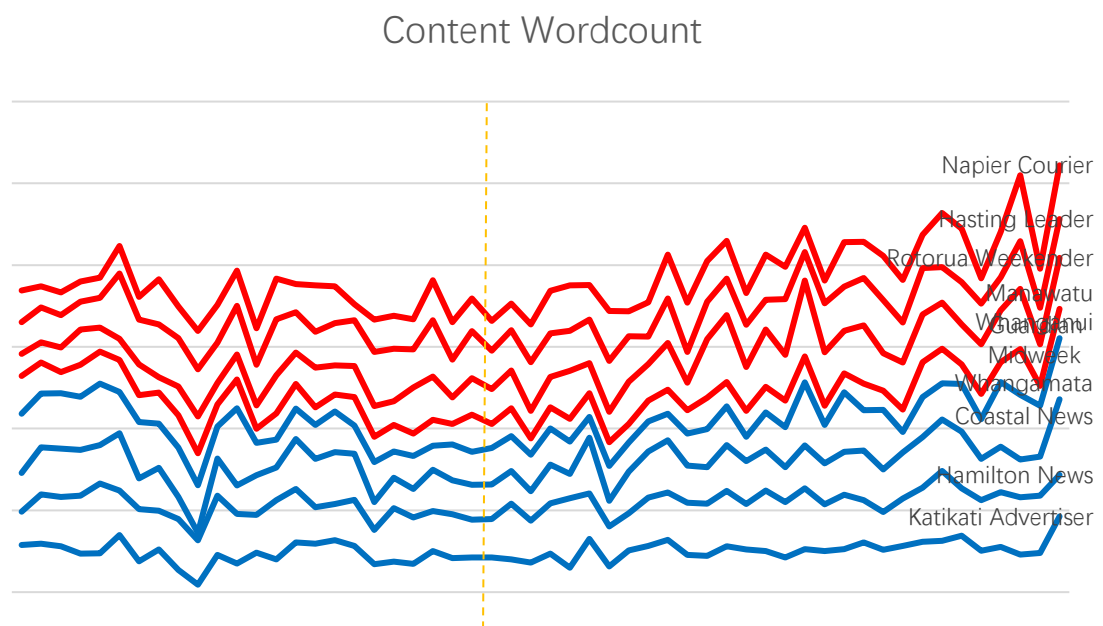
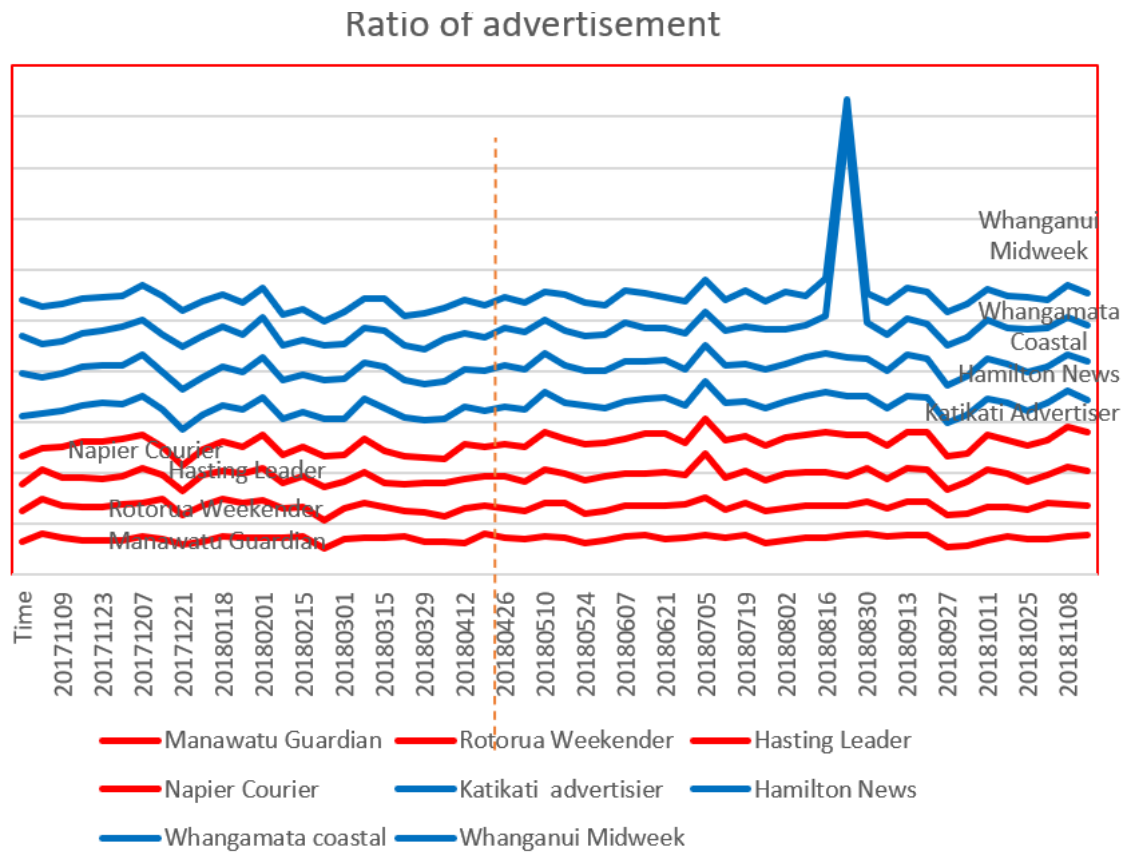


Figure 3: Ratio of Advertisement



Average ratio of advertisement:  $\leftarrow$

Treated group: Manawatu Guardian:0.71 Rotorua Weekender:0.63 Hasting Leader:0.61 Napier Courier: 0.65 $\leftarrow$

Control group: Katikati advertiser: 0.72 Hamilton News: 0.75 Whangamata Coastal: 0.78 Whanganui Midweek:0.63 $\leftarrow$

Figure 4: Gross Area of Advertising Space

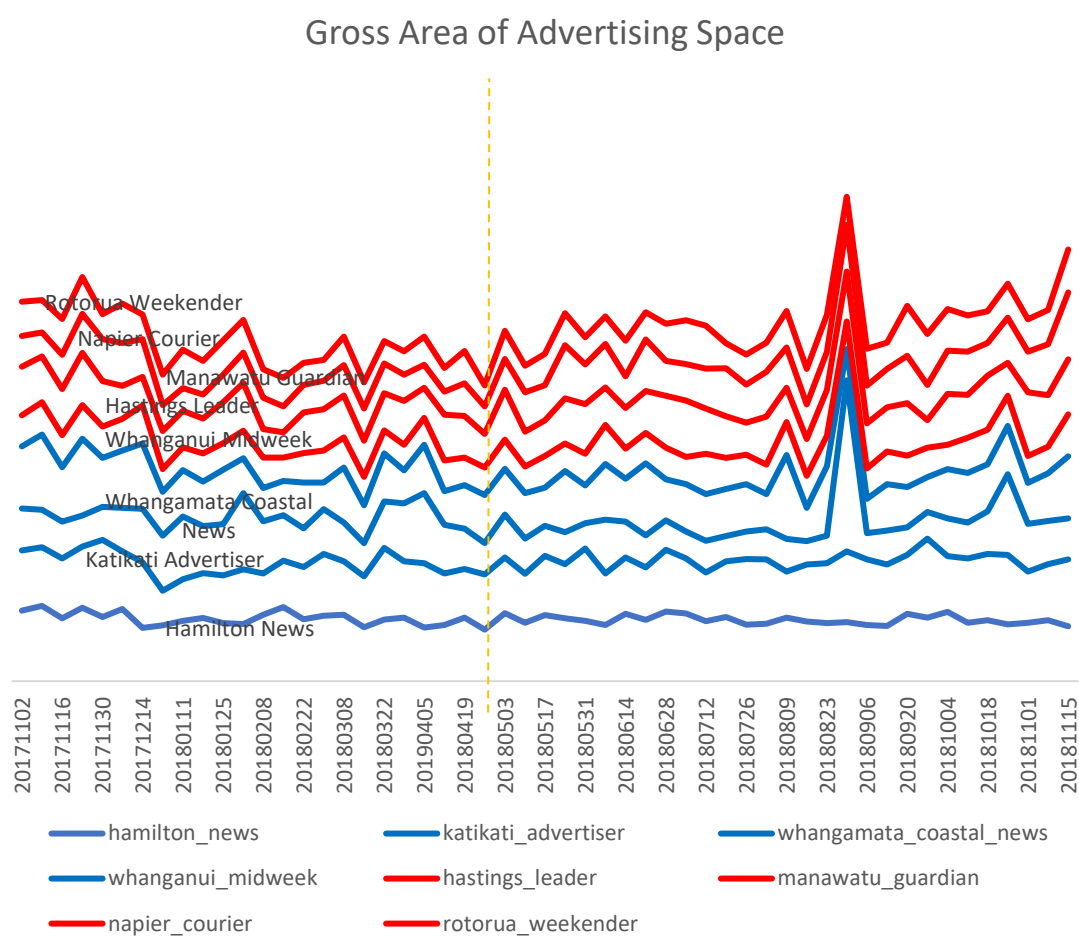
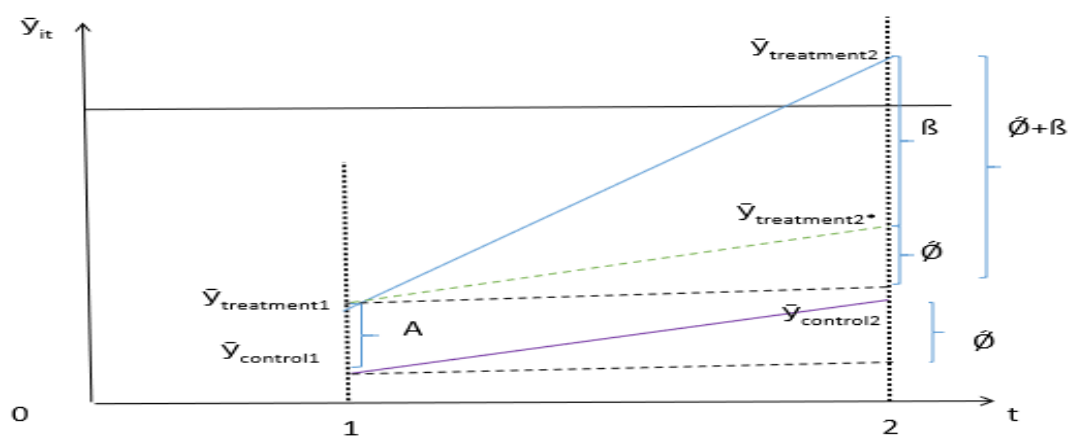


Figure 5:



(source: Fredriksson & Oliveira, 2019)

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